

Work Order ID 138477

Wednesday, October 28, 2015 12:55:25 PM

138477

Page 1

Item ID: D206-667-107BL Accept ***N900040100*** Setup Start ***NS1***
 Revision ID: Stop ***NS2***
 Item Name: Fwd Crosstube - Mid Height 206L / L1 / L3 / L4, Blue
 Start Date: 10/28/2015 Start Qty: 1.00 ***1*** Cust Item ID:
 Required Date: 10/28/2015 Req'd Qty: 1.00 ***1*** Customer:
 Reference:

Approvals: Process Plan: MLS Date: OCT 28 2015 Tooling: _____ Date: _____ Run Start ***NR1***
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D206-667-147	A (DEO)								
DSI9565	A								
DSI9628	A								
IIN-D206-667	D								
100	Document Control	0.00							
100	DOCUMENT CONTROL								<u>MLS FEB 27 2016</u>
DC	Memo	0.00							
Doc.Control -USB or Paperwork	Photocopy bluefile and create labels as per PPP D206-667-107 chg 003								DAS 28 9-69 FEB 23 2016
110	Pick Kit	0.00							
110	Packaging								
Packaging	Memo	0.00							<u>BCL 16/01/25</u>
Packaging									

D206-667-107BL/138477

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval		
Description Work Order Deviation				Disposition					
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐		FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Mislabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐		OTHER : ☐					

Work Order ID 138477

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Page 2

Item ID: D206-667-107BL**Accept*****N900040100*****Setup Start *NS1*****Revision ID:****Stop *NS2*****Item Name:** Fwd Crosstube - Mid Height 206L / L1 / L3 / L4, Blue**Start Date:** 10/28/2015 **Start Qty:** 1.00 ***1*****Cust Item ID:****Required Date:** 10/28/2015 **Req'd Qty:** 1.00 ***1*****Customer:****Reference:****Approvals:** **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____**Run Start *NR1*****QC:** _____ **Date:** _____ **SPC (Y/N):** _____ **Date:** _____**Stop *NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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120

0.00

120

BENDING MACHINE - CROSSTUBES

CNC Bend 2

Memo

0.02

CNC Alpha 160 Bender

Bend tube as per Dwg D206-667-147 using CNC bender program

BL 16/01/25

130

QC15- Crosstube Dimensional Check

0.00

130

QC

Memo

0.00

Quality Control

DAS

47**9-89**1 Ø16-01-26

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval		
Description Work Order Deviation				Disposition					

Root Cause				FAULT CATEGORY			
Environment	☐	No Re-verification	☐	Pressure/Forced	☐	Temperature/Cure	☐
Design	☐	Operator	☐	Bending	☐	Set-up	☐
Doc/Data	☐	Offset/Setup	☐	Centre Not Concentric	☐	BOM/Route	☐
Equip/Tooling	☐	Supplier	☐	Cracks	☐	Broken/Damage/Defect	☐
Handling/Pre	☐	Training	☐	Crimp/Kink/Ripple/Wave	☐	Inspection Incomplete/Unqualified	☐
Material	☐	Use for Testing	☐	Cuffs	☐	Contamination	☐
Internal Transport	☐	Poor Information	☐	Crushing	☐	Countersink	☐
Tribal Knowledge	☐	Rushing	☐	Heat Treat	☐	Cut Too Short	☐
LOA	☐	Product Improvement	☐	Wave/Twist in Tube	☐	Instructions Incomplete/Unclear	☐
Substation	☐	Process Improvement	☐	Marks/Chatter	☐	Drill Holes	☐
Past Expiry Date	☐	Manufacturing Process	☐	OTHER : _____			
Misidentified	☐	Past Due	☐				

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Item ID: D206-667-107BL

Accept

N900040100Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Fwd Crosstube - Mid Height 206L / L1 / L3 / L4, Blue

Start Date: 10/28/2015 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 10/28/2015 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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140

140

Crosstubes

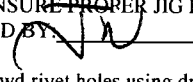
Crosstubes

0.00

Memo 0.02

***** ENSURE PROPER JIG POSITIONING BEFORE DRILLING*****
VERIFIED BY:  *****

1- Drill holes & ream using drill Jig DT8541 & DT8542 as per Dwg D206-667-147. Drill all (3) top holes. Holes facing inboard.

***** ENSURE PROPER JIG POSITIONING BEFORE DRILLING*****
VERIFIED BY:  *****2- Drill Fwd rivet holes using drill Jig DT8787 fwd as per Dwg D206-667-147.
Note: Fwd side has 3x top holes. Facing inboard.

3- C'sink holes as per Dwg D206-667-147. Allow rivet to sit below surface to compensate for paint.

4- Flip tube and switch drilling Jigs from right to left, left to right. Locate Jigs off existing holes using "T" pins. Drill ONLY 2 top holes ONLY plug most bottom holes to prevent accidental drilling. Drill holes and ream using drill Jig DT8541 & DT8542 as per Dwg D206-667-147. Drill only the top (2) holes.

***** ENSURE PROPER JIG POSITIONING BEFORE DRILLING*****
VERIFIED BY:  *****

5- Drill Aft rivet holes using drill Jig DT8787 aft as per Dwg D206-667-147.

***** ENSURE PROPER JIG POSITIONING BEFORE DRILLING*****
VERIFIED BY:  *****

BC 16/04/26

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

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Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval		
Description Work Order Deviation				Disposition					
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐		FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐		Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Mislabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐					
		OTHER : ☐							

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Item ID: D206-667-107BL Accept ***N900040100*** Setup Start ***NS1***
Revision ID: Stop ***NS2***
Item Name: Fwd Crosstube - Mid Height 206L / L1 / L3 / L4, Blue
Start Date: 10/28/2015 Start Qty: 1.00 ***1*** Cust Item ID:
Required Date: 10/28/2015 Req'd Qty: 1.00 ***1*** Customer:
Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
	6- C'sink holes as per Dwg D206-667-147. Allow rivet to sit below surface to compensate for paint.								
	7- Scribe part # and batch # using vibrating stylus as per Dwg D206-667-147 Inside of Cuff (Do not engrave on outside of tube)								
	8- *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D206-667-147								
150		0.00							
150									
HandFXtube									
Hand Finishing Crosstubes									
	Memo	0.00							
	IMMEDIATELY AFTER GRINDING								
	1- PRESSURE WASH X-TUBE INSIDE AND OUT								
	2- ALODINE AND ACID ETCH X-TUBE INSIDE AND OUT AS PER QSI005.								
160	QC7-Inspect Chemical Conversion Coat	0.00							
160									
QC									
Quality Control	Memo	0.00							

150 *16/02/01*

160 *16/02/01*

160 *16/02/01* *SVQ*

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS <table style="width:100%; border: none;"> <tr> <td style="width:15%;">Skid-tube ☐</td> <td style="width:15%;">Cross tube ☐</td> <td style="width:15%;">Water Jet ☐</td> <td style="width:15%;">Engineering ☐</td> </tr> <tr> <td>Machining ☐</td> <td>Small Fab ☐</td> <td>Prod. Eng. Coord. ☐</td> <td>Quality ☐</td> </tr> <tr> <td>Thermoforming ☐</td> <td>Finishing ☐</td> <td>Rec/Store/Packaging ☐</td> <td>Other ☐</td> </tr> <tr> <td>Large Fab ☐</td> <td>Composite ☐</td> <td>Supplier ☐</td> <td></td> </tr> </table>						Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐	
Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐																						
Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐																						
Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐																						
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Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval																		
Description Work Order Deviation				Disposition																					

Root Cause				FAULT CATEGORY																																																																																																																											
Environment	☐	Design	☐	Doc/Data	☐	Equip/Tooling	☐	Handling/Pre	☐	Material	☐	Internal Transport	☐	Tribal Knowledge	☐	LOA	☐	Substation	☐	Past Expiry Date	☐	Misidentified	☐	No Re-verification	☐	Operator	☐	Offset/Setup	☐	Supplier	☐	Training	☐	Use for Testing	☐	Poor Information	☐	Rushing	☐	Product Improvement	☐	Process Improvement	☐	Manufacturing Process	☐	Past Due	☐	Pressure/Forced	☐	Bending	☐	Centre Not Concentric	☐	Cracks	☐	Crimp/Kink/Ripple/Wave	☐	Cuffs	☐	Crushing	☐	Heat Treat	☐	Wave/Twist in Tube	☐	Marks/Chatter	☐	Temperature/Cure	☐	Set-up	☐	BOM/Route	☐	Broken/Damage/Defect	☐	Inspection Incomplete/Unqualified	☐	Contamination	☐	Countersink	☐	Cut Too Short	☐	Instructions Incomplete/Unclear	☐	Drill Holes	☐	Power Loss/Surge	☐	Folio/Program	☐	Grain	☐	Weld	☐	Wrong Stock Pulled	☐	Out of Sequence	☐	Off-set	☐	Mislabeled	☐	Fit/Function	☐	Misaligned/off center	☐	Positioned Wrong	☐	Outside Dimensions	☐	Over/Under tolerance	☐	Part Incorrect	☐	Part Lost/Missing	☐	Part Moved	☐	Drawing	☐	Finish	☐	Misread	☐	Turning Sequence	☐
OTHER : _____																																																																																																																															

Work Order ID 138477

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Item ID: D206-667-107BL

Accept

N900040100Setup Start ***NS1***

Revision ID:

Item Name: Fwd Crosstube - Mid Height 206L / L1 / L3 / L4, Blue

Stop ***NS2***Start Date: 10/28/2015 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 10/28/2015 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start ***NR1***Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
170	QC5- Inspect part completeness to step on W/O	0.00							
170								16/02/02	DAS 49
QC	Memo	0.00							9-89
Quality Control									

180	Outsource process - NDT per QSI038 4.1	0.00							
180									
Outsource2	Memo	2.00							
Outsource process - NDT	*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***								

FEB 08 2016
DAS
13
9-89

190	Packaging	0.00							
190									
Packaging	Memo	0.00							
Packaging	*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***								
	Ensure copy of NDT results attached to work order.								

FEB 09 2016

DAS
6
9-89

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

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Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval 		
Description Work Order Deviation				Disposition					
							Completed By		
							Lead hand / Supervisor Approval Verification		
							QC / QA Coordinator Approval		

Root Cause				FAULT CATEGORY							
Environment	☐	No Re-verification	☐	Pressure/Forced	☐	Temperature/Cure	☐	Power Loss/Surge	☐	Positioned Wrong	☐
Design	☐	Operator	☐	Bending	☐	Set-up	☐	Folio/Program	☐	Outside Dimensions	☐
Doc/Data	☐	Offset/Setup	☐	Centre Not Concentric	☐	BOM/Route	☐	Grain	☐	Over/Under tolerance	☐
Equip/Tooling	☐	Supplier	☐	Cracks	☐	Broken/Damage/Defect	☐	Weld	☐	Part Incorrect	☐
Handling/Pre	☐	Training	☐	Crimp/Kink/Ripple/Wave	☐	Inspection Incomplete/Unqualified	☐	Wrong Stock Pulled	☐	Part Lost/Missing	☐
Material	☐	Use for Testing	☐	Cuffs	☐	Contamination	☐	Out of Sequence	☐	Part Moved	☐
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Tribal Knowledge	☐	Rushing	☐	Heat Treat	☐	Cut Too Short	☐	Mislabeled	☐	Finish	☐
LOA	☐	Product Improvement	☐	Wave/Twist in Tube	☐	Instructions Incomplete/Unclear	☐	Fit/Function	☐	Misread	☐
Substation	☐	Process Improvement	☐	Marks/Chatter	☐	Drill Holes	☐	Misaligned/off center	☐	Turning Sequence	☐
Past Expiry Date	☐	Manufacturing Process	☐	OTHER :							
Misidentified	☐	Past Due	☐								

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Item ID: D206-667-107BL Accept ***N900040100*** Setup Start ***NS1***
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Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
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Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
200	QC5- Inspect part completeness to step on W/O	0.00							DAS 38 9-89
200									
QC	Memo	0.00							
Quality Control	*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***								FEB 09 2016
210		0.00							DAS 41 9-89
210	SprayPaint								
SprayPaint	Memo	0.00							
Spray Painting	*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***								16-2-10
	1-Prime inside and outside crosstube as per QSI 005 4.2								
	2-Paint outside crosstube as per QSI 005 4.2								
	PRIME: 134188								
	Start Time: 700								
	Finish Time: 800								
	PAINT: 132641								
	Start Time: 100								
	Finish Time: 200								
	Clear: 129058								

DQA: _____ Date: _____



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Misidentified ☐	Past Due ☐																																																																

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Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
220	QC14- Inspect Spray Paint	0.00							DAS 38
220									9-88
QC	Memo	0.00							
Quality Control	Wrap in plastic bag to protect from scratches								FEB 22 2016
230	Crosstubes	0.00							DAS 41
230									9-89
Crosstubes	Memo	0.01							
Crosstubes	1-Abrade mating surfaces of support and crosstube with 400 grit sandpaper, clean the area with 4105S wash 'n' wipe								6-2-16
	2-Install supports with Proseal 890 per DSI9565 and QSI 015								
	A/R Proseal 890 Batch: <u>133640</u>								
	3- Torque bolts as per dwg								
	4-Install nut plates as per Dwg D206-667-147. Touch-up rivet heads with Imron paint.								
	Sikafter 133122								

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval		
Description Work Order Deviation				Disposition					
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐		FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Mislabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐		OTHER : ☐					

Work Order ID 138477

Wednesday, October 28, 2015 12:55:25 PM

138477

Page 8

Item ID: D206-667-107BL Accept ***N900040100*** Setup Start ***NS1***
 Revision ID: Stop ***NS2***
 Item Name: Fwd Crosstube - Mid Height 206L / L1 / L3 / L4, Blue
 Start Date: 10/28/2015 Start Qty: 1.00 ***1*** Cust Item ID:
 Required Date: 10/28/2015 Req'd Qty: 1.00 ***1*** Customer:
 Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
240	QC5- Inspect part completeness to step on W/O	0.00							DAS 38 9-89
240									
QC	Memo	0.00							
Quality Control									FEB 22 2016
250	Pick Kit	0.00							
250									
Packaging	Memo	0.00							
Packaging									
260	QC4- 100% Inspect kits for completeness	0.00							
260									
QC	Memo	0.00							
Quality Control									DAS 28 9-89 FEB 23 2016

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS <table style="width:100%; border: none;"> <tr> <td style="width:15%;">Skid-tube</td><td style="width:5%;">☐</td> <td style="width:15%;">Cross tube</td><td style="width:5%;">☐</td> <td style="width:15%;">Water Jet</td><td style="width:5%;">☐</td> <td style="width:15%;">Engineering</td><td style="width:5%;">☐</td> </tr> <tr> <td>Machining</td><td>☐</td> <td>Small Fab</td><td>☐</td> <td>Prod. Eng. Coord.</td><td>☐</td> <td>Quality</td><td>☐</td> </tr> <tr> <td>Thermoforming</td><td>☐</td> <td>Finishing</td><td>☐</td> <td>Rec/Store/Packaging</td><td>☐</td> <td>Other</td><td>☐</td> </tr> <tr> <td>Large Fab</td><td>☐</td> <td>Composite</td><td>☐</td> <td>Supplier</td><td>☐</td> <td></td><td></td> </tr> </table>						Skid-tube	☐	Cross tube	☐	Water Jet	☐	Engineering	☐	Machining	☐	Small Fab	☐	Prod. Eng. Coord.	☐	Quality	☐	Thermoforming	☐	Finishing	☐	Rec/Store/Packaging	☐	Other	☐	Large Fab	☐	Composite	☐	Supplier	☐																																																																																																
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Work Order ID 138477***138477***

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Item ID: D206-667-107BL Accept ***N900040100*** Setup Start ***NS1***
Revision ID: Stop ***NS2***
Item Name: Fwd Crosstube - Mid Height 206L / L1 / L3 / L4, Blue
Start Date: 10/28/2015 Start Qty: 1.00 ***1*** Cust Item ID:
Required Date: 10/28/2015 Req'd Qty: 1.00 ***1*** Customer:
Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
270	Packaging	0.00							
270									
Packaging	Memo	0.00							
Packaging	Identify and pack for shipping as per PPP D206-667-107 Location: FG035								
280	QC21 - Final Inspection - Work Order Release	0.00							
280									
QC	Memo	0.00							
Quality Control									

1 DAS 28 9-89 FEB 24 2016

ML5 FEB 25 2016

ML5 FEB 24 2016

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐							
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval				
Description Work Order Deviation				Disposition							
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐		☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due		FAULT CATEGORY ☐ Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter		☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes		☐ Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Misabeled ☐ Fit/Function ☐ Misaligned/off center		☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence	
				OTHER :							

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138477

***D206-667-107BI ***

Required Date: 10/28/2015

Required Qty: 1.00

IPP REV:B
IPP REV:C 12.08.20

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D206-667-147TRN		Manufactured	No			110	Each	0.0000	1	1			
D206-667-147TRN Crosstube Assembly, Mid Fwd <i>B136985</i>													
D2873-043		Manufactured	No			230	Each	72.0000	2	2			
D2873-043 Nut Plate Assembly <i>136123</i>													
				<u>Location</u>		<u>Loc Qty</u>		<u>Loc Code</u>					
				LG050		72							
				135398		32							
				137626		40							
D2873-045		Manufactured	No			230	Each	62.0000	2	2			
D2873-045 Nut Plate Assembly 													
				<u>Location</u>		<u>Loc Qty</u>		<u>Loc Code</u>					
				LG050		62							
				134433		1							
				136187		51							
				137696		10							

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval		
Description Work Order Deviation				Disposition					

Root Cause				FAULT CATEGORY			
Environment	☐	No Re-verification	☐	Pressure/Forced	☐	Temperature/Cure	☐
Design	☐	Operator	☐	Bending	☐	Set-up	☐
Doc/Data	☐	Offset/Setup	☐	Centre Not Concentric	☐	BOM/Route	☐
Equip/Tooling	☐	Supplier	☐	Cracks	☐	Broken/Damage/Defect	☐
Handling/Pre	☐	Training	☐	Crimp/Kink/Ripple/Wave	☐	Inspection Incomplete/Unqualified	☐
Material	☐	Use for Testing	☐	Cuffs	☐	Contamination	☐
Internal Transport	☐	Poor Information	☐	Crushing	☐	Countersink	☐
Tribal Knowledge	☐	Rushing	☐	Heat Treat	☐	Cut Too Short	☐
LOA	☐	Product Improvement	☐	Wave/Twist in Tube	☐	Instructions Incomplete/Unclear	☐
Substation	☐	Process Improvement	☐	Marks/Chatter	☐	Drill Holes	☐
Past Expiry Date	☐	Manufacturing Process	☐	OTHER :			
Misidentified	☐	Past Due	☐				

Picklist Print

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Work Order ID: 138477

138477

Parent Item: D206-667-107BL

***D206-667-107BL ***

Parent Item Name: Fwd Crosstube - Mid Height 206L / L1 / L3 / L4, Blue

Start Date: 10/28/2015

Required Date: 10/28/2015

Start Qty: 1.00

Required Qty: 1.00

D2891-1 Manufactured No

230 Each 35.0000 2 2

D2891-1

Support 2.25

DAS
41
9-89

16-2-16

Location	Loc Qty	Loc Code
FG	2	
84164	2	
LG052	33	
134307	3	
135391	14	
136117	16	

140982

2

D3595-063-395 Manufactured No

230 Each 113.0000 4 4

D3595-063-395

Rubber Cushion 0.63" wide x 3.95" Long

DAS
41
9-89

16-2-16

Location	Loc Qty	Loc Code
FG	5	
87353	5	
LG051	108	
131818	4	
135042	64	
136512	40	

4

cut (4)0.063" X 3.95"

MS20601-AD4W8 Purchased No

230 Each 257.0000 14 14

MS20601-AD4W8

RIVET

DAS
41
9-89

16-2-10

Location	Loc Qty	Loc Code
CCK005	200	
M133031	200	
LG051	6	
M132256	6	
ST308	51	
M132107	51	

133577

16-2 scrap

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Shop Packet Print

Page 2

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval		
Description Work Order Deviation				Disposition					
Root Cause		FAULT CATEGORY							
Environment ☐	No Re-verification ☐	Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐				
Design ☐	Operator ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐				
Doc/Data ☐	Offset/Setup ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐				
Equip/Tooling ☐	Supplier ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐				
Handling/Pre ☐	Training ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐				
Material ☐	Use for Testing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐				
Internal Transport ☐	Poor Information ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐				
Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐				
LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐				
Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐				
Past Expiry Date ☐	Manufacturing Process ☐	OTHER :							
Misidentified ☐	Past Due ☐								

Picklist Print

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Work Order ID: 138477

138477

Parent Item: D206-667-107BL

***D206-667-107BI ***

Parent Item Name: Fwd Crosstube - Mid Height 206L / L1 / L3 / L4, Blue

Start Date: 10/28/2015

Required Date: 10/28/2015

Start Qty: 1.00

Required Qty: 1.00

MS21920-20

Purchased

No

230

Each

126.0000

4

4

DAS

41

9-89

16-2-16

MS21920-20

Clamp

**

Location

Loc Qty

Loc Code

FG

2

122254

2

LG

50

m133134

50

4

LG050

7

m128650

7

LG056

67

m132675

67

AN5-30A

Purchased

No

250

Each

75.0000

4

4

AN5-30A

BOLT

**

133932 14

Location

Loc Qty

Loc Code

ST299A

65

M127363

65

ST337

10

M127363

10

AN5-32A

Purchased

No

250

Each

219.0000

4

4

AN5-32A

Bolt

**

Location

Loc Qty

Loc Code

ST299A

180

m132857

30

m133323

150

ST336

32

m132536

32

ST337

7

m131139

7

DAS
28
9-89

DAS
28
9-89

DAS
6 21
9-89

DAS
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9-89

FEB 22 2016

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Page 3

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐							
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval				
Description Work Order Deviation				Disposition							
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐		No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐		Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐		FAULT CATEGORY Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐		Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Misabeled ☐ Fit/Function ☐ Misaligned/off center ☐		Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐	
				OTHER :							

Picklist Print

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Page 4

Work Order ID: 138477

138477

Parent Item: D206-667-107BL

***D206-667-107BL ***

Parent Item Name: Fwd Crosstube - Mid Height 206L / L1 / L3 / L4, Blue

Start Date: 10/28/2015

Required Date: 10/28/2015

Start Qty: 1.00

Required Qty: 1.00

AN5-7A Purchased No 250 Each 4,279.000 10 10

AN5-7A

Bolt

DAS
28
9-89

Location	Loc Qty	Loc Code
ST299A	4230	
M119017	2400	
M123355	1510	
M123532	20	
m126010	300	
ST338	49	
m126105	49	

DAS
6
9-89

DAS
27
9-89

AN970-4 Purchased No 250 Each 327.0000 12 12

AN970-4

Washer

DAS
28
9-89

Location	Loc Qty	Loc Code
ST260a	100	
m133235	100	
ST329	227	
129521	207	
m129521	20	

DAS
6
9-89

DAS
27
9-89

134039

FEB 22 2016

D206-667-017 Manufactured No 250 Each 10.0000 1 1

D206-667-017

Grounding Strap

DAS
41
9-89

16-2-18

Location	Loc Qty	Loc Code
FG	4	
134884	2	
97504	2	
LG050	2	
134322	2	
LG054	4	
136422	4	

136423

1

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Page 4

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

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OTHER :																																																															

Picklist Print

Wednesday, October 28, 2015 12:55:28 PM

Page 5

Work Order ID: 138477

138477

Parent Item: D206-667-107BL

***D206-667-107BI ***

Parent Item Name: Fwd Crosstube - Mid Height 206L / L1 / L3 / L4, Blue

Start Date: 10/28/2015

Required Date: 10/28/2015

Start Qty: 1.00

Required Qty: 1.00

MS21042L5

Purchased

No

250

Each

485.0000

4

4

MS21042L5

Nut

**

133790

DAS 27 9-89
6 9-89

DAS 28 9-89

Location

Loc Qty

Loc Code

GA	146	
m127813	146	
ST305	339	
m127813	19	
m131340	21	
m132123	8	
m132677	91	
m133363	200	

NAS1149D0563J

Purchased

No

250

Each

1,227.000

18

18

NAS1149D0563.J

Washer

**

133938

DAS 27 9-89
6 9-89

DAS 28 9-89

Location

Loc Qty

Loc Code

GA	53	
m125807	53	
ST260a	928	
m130799	63	
m132035	55	
m132256	10	
m133134	300	
m133363	500	
ST269	227	
m128257	156	
m132677	71	
ST271	19	
m131026	19	

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Page 5

DQA: _____ Date: _____



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Work Order update only ☐

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		OTHER : ☐																																																																					

Item	Qty -147	Part Number	Description
1	X	D206-667-147	CROSSTUBE ASSEMBLY (206L MID FWD)
2	1	D6002-115	CROSSTUBE
3	2	D2873-043	NUT PLATE
4	2	D2873-045	NUT PLATE
5	2	D2891-1	SUPPORT
6	4	D3595-063-395	RUBBER CUSHION
7	4	MS21920-20	CLAMP (OR MS21920-21)
8	14	MS20601AD4W8	RIVET (OR NAS9302B-4-8)
9	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299- 947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6002-115
FINISHED LENGTH = 99.84±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D206-667-147" AND BATCH NUMBER ON
INSIDE OF CUFF PER DART QSI 044 6.4 (VIBRATING STYLUS).
- 7) WEIGHT: 15.0 lbs (-507 ± 12.84)
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT EDGE LONGITUDINALLY,
TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 10 PASSES. MAXIMUM TUBE FLATTENING DUE
TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2891-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI
015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-20 CLAMPS (OR -21) WITH D3595-063-395 RUBBER CUSHIONS TO SECURE
THE D2891-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMP MECHANISMS
ARE LOCATED ON CROSSTUBE SUPPORTS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS
SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT
LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN
SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT

WITHOUT NOTICE
WORK ORDER

NO. 138477-MLJ

15-10-28

DEO ATTACHED

ECW #11-615
11.07.28

UNDER REVIEW

RELEASED
2011-05-23
JMT

REV.	DESCRIPTION	CP	10.11.23
A	NEW ISSUE	BY	DATE
DESIGN			
DRAWN			
CHECKED			
MFG. APPR.			
APPROVED			
DE APPR.			
DATE	10.12.23		

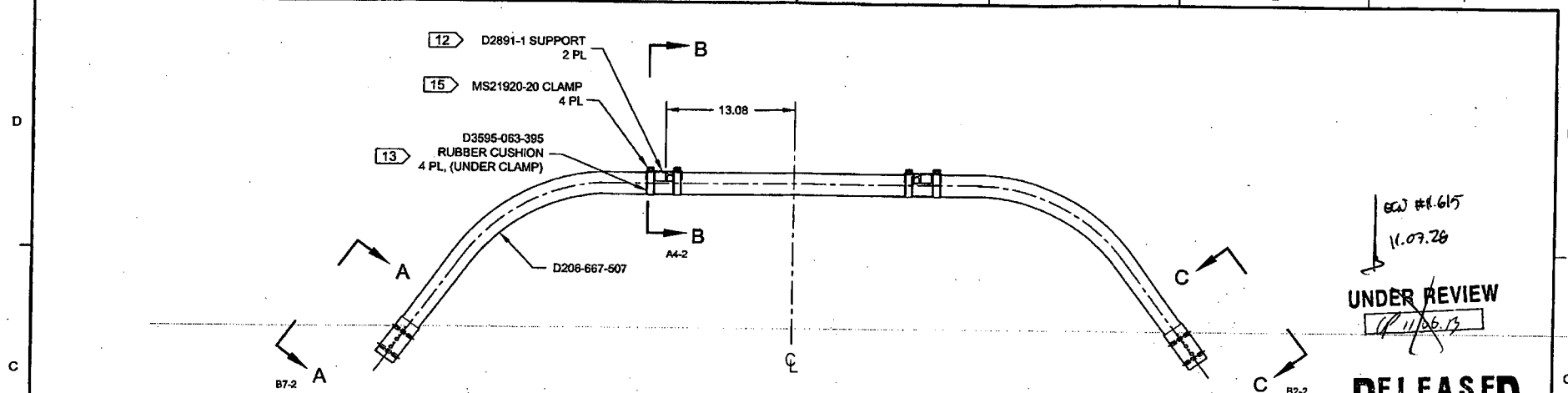
DART AEROSPACE LTD
HAWKESBURY, ONTARIO, CANADA

DRAWING NO. REV. A
D206-667-147 SHEET 1 OF 4

TITLE SCALE
CROSSTUBE ASS'Y (206L MID FWD) NTS

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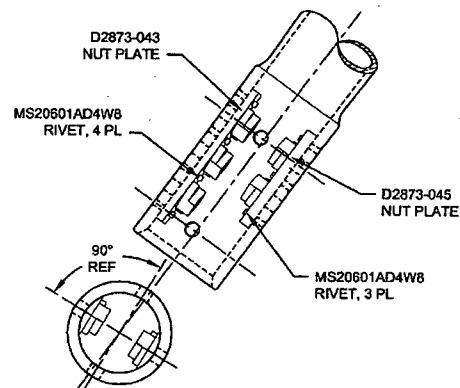
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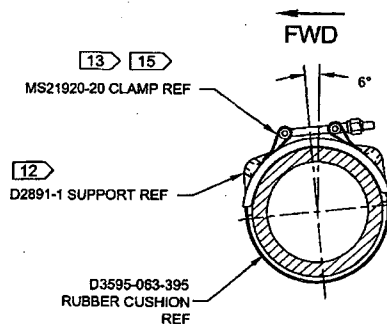
D206-667-147
ASSEMBLY DETAIL
(VIEW LOOKING FWD)

ECN #1.615
11.07.28
UNDER REVIEW
(Signature)

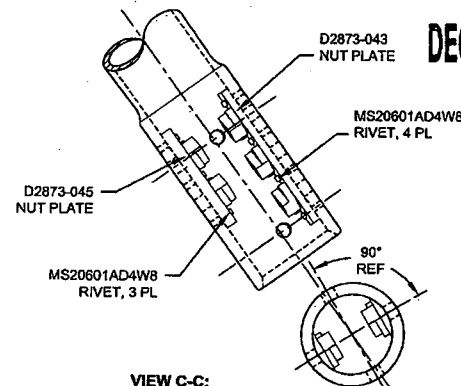
RELEASED
2011-05-24
DEO ATTACHED



VIEW A-A:
CUFF DETAIL
SCALE 4X



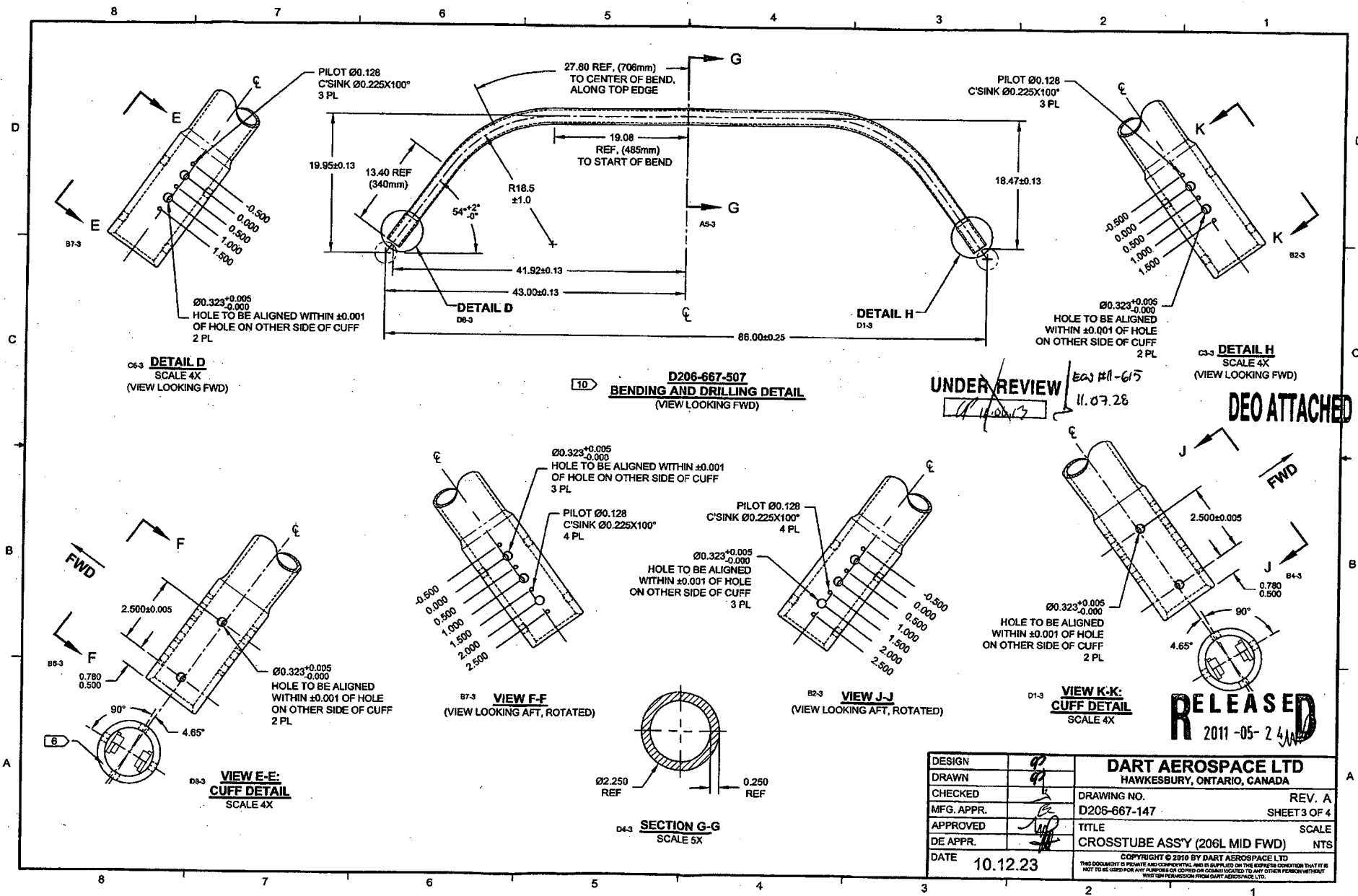
SECTION B-B
SCALE 5X



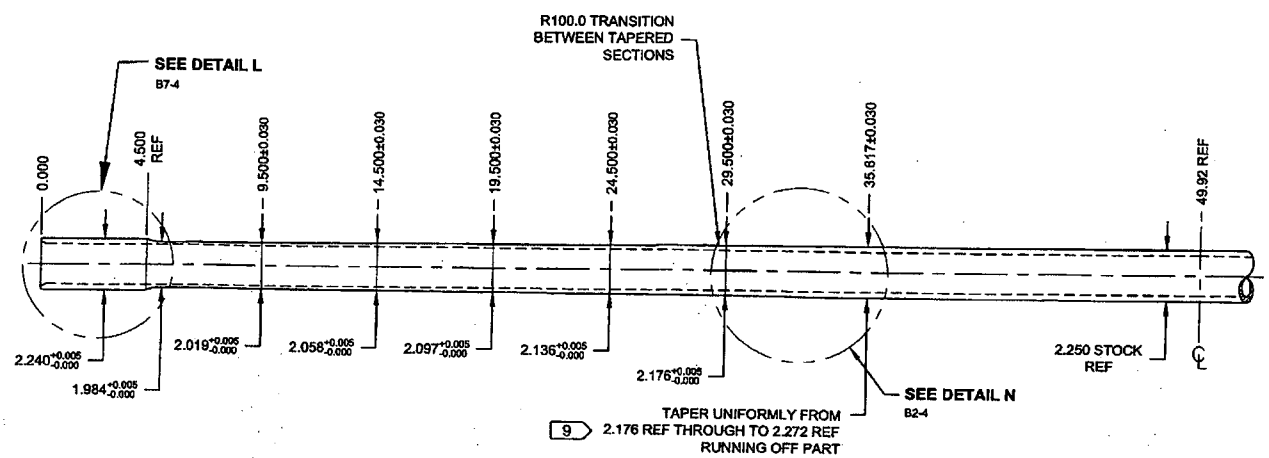
VIEW C-C:
CUFF DETAIL
SCALE 4X

DESIGN	<i>(Signature)</i>	DART AEROSPACE LTD	
DRAWN	<i>(Signature)</i>	HAWKESBURY, ONTARIO, CANADA	
CHECKED	<i>(Signature)</i>	DRAWING NO. D206-667-147	REV. A
MFG. APPR.	<i>(Signature)</i>		SHEET 2 OF 4
APPROVED	<i>(Signature)</i>	TITLE	SCALE
DE APPR.	<i>(Signature)</i>	CROSSTUBE ASSY (206L MID FWD)	NTS
DATE	10.12.23	COPYRIGHT © 2010 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

8 7 6 5 4 3 2 1

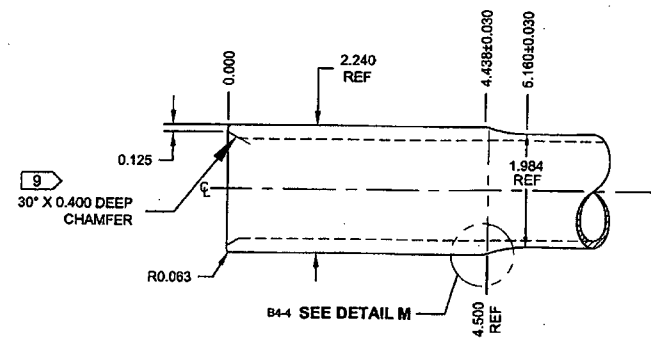


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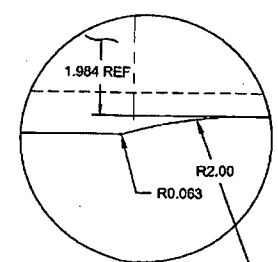


UNDER REVIEW
 11.06.13
 604 # 11-615
 11.07.20

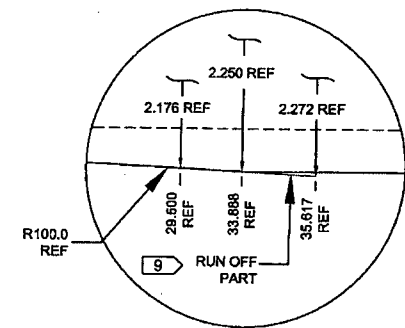
TURNING DETAIL



**DETAIL L:
CROSSTUBE CUFF**
NOT TO SCALE



**DETAIL M:
CUFF TRANSITION**
NOT TO SCALE



**DETAIL N:
TAPER RUN-OFF**
NOT TO SCALE

RELEASED
 2011-05-23

DESIGN	9	DART AEROSPACE LTD	
DRAWN	9	HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. A
MFG. APPR.	9	D206-667-147	SHEET 4 OF 4
APPROVED	9	TITLE	SCALE
DE APPR.	9	CROSSTUBE ASS'Y (206L MID FWD)	NTS
DATE	10.12.23	COPYRIGHT © 2010 BY DART AEROSPACE LTD	
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8 7 6 5 4 3 2 1

DRAWING NO. D206-667-147	TITLE CROSSTUBE ASS'Y (206L MID FWD)	REV. A	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D206-667-147-A-1	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>92</i>	CHECKED <i>ADS</i>	MFG. APPR. <i>AB</i>	APPROVED <i>MD</i>		DE APPR. <i>MD</i>		
DATE 11.07.15	DATE 11.07.20	DATE 11.07.21	DATE 11.07.21		DATE 11.07.21		

PURPOSE:

REPLACE MAGNOBOND WITH PROSEAL.

CHANGE:

IS:

Item	Qty -147	Part Number	Description
9	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

WAS:

9	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
---	-----	----------------	---

NOTE 12 & 15, SHEET 1 IS AMENDED AS FOLLOWS:

IS:

- 12) TO INSTALL D2891-1 SUPPORT: ABRABE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. **PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.**

WAS:

- 12) INSTALL D2891-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

RELEASED
2011-07-28

DRAWING NO. D206-667-147	TITLE CROSSTUBE ASS'Y (206L MID FWD)	REV. A	DART AEROSPACE LTD ENGINEERING ORDER	D.E.O. NO. D206-667-147-A-2	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN AJS	CHECKED	MFG. APPR.	APPROVED	DE APPR.		
DATE 12.08.02	DATE 12.08.02	DATE 12.08.02	DATE 12.08.02	DATE 12.08.02	DATE 12.08.02	

PURPOSE:

ADD ELECTRICAL GROUNDING STRAP

CHANGE:

PARTS LIST:

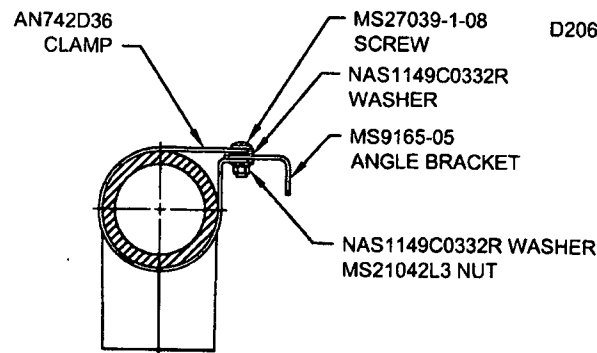
ITEM	QTY -147	PART NUMBER	DESCRIPTION
1	X	D206-667-147	CROSSTUBE ASSEMBLY (206L MID FWD)
10	2	AN742D36	CLAMP
11	2	MS9165-05	ANGLE BRACKET
12	2	MS21042L3	NUT (OR MS21042-3)
13	2	MS27039-1-08	SCREW
14	4	NAS1149C0332R	WASHER (OR AN960C10L)

GENERAL NOTES:

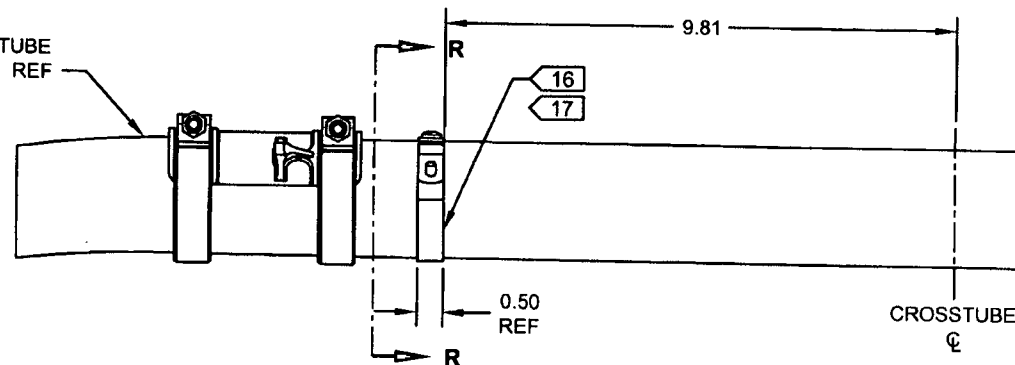
- 16) MASK AREA UNDER CLAMP PRIOR TO PAINTING
- 17) SEAL EDGES WHERE AN742D36 CLAMP MEETS WITH THE CROSSTUBE USING SIKAFLEX-241/-291 OR MIL-S-8802 CLASS B2 OR PROSEAL 890 SEALANT
- 18) PERFORM RESISTANCE CHECK TO ENSURE MAX RESISTANCE IS 10 MILLIOHMS

→ AFT

RELEASED
12.08.17
ECN 12-451



SECTION R-R



DETAIL P
BONDING STRAP INSTALLATION 2 PL

DART SERVICE INSTRUCTION

TO AMEND INSTRUCTIONS FOR CONTINUOUS AIRWORTHINESS ICA-D206-667 Rev. 3 OR LATER

REF. CANADIAN STC: SH01-5

REF. FAA STC: SR01304NY

REF. EASA STC: EASA.IM.R.S.01179

PURPOSE:

The supports on the following crosstubes are now installed using Proseal instead of Magnobond:

D206-667-101 @ CHG 004

D206-667-103 @ CHG 005

D206-667-107 @ CHG 002

D206-667-201 @ CHG 004

D206-667-203 @ CHG 004

D206-667-207 @ CHG 002

D407-667-105 @ CHG 004

CHANGE:

For the crosstubes listed above, section 32.4 of ICA-D206-667 is amended as follows. Use Figures 32-4 to 32-8 of ICA-D206-667 for further reference. For crosstubes of an earlier change number, it is recommended that if the supports are removed, the supports should be reinstalled using the procedure listed below.

32.4 SUPPORT INSTALLATION

- 32.4.1 Locate the area on crosstube for installation of support (ref. Figures 32-4 to 32-8 of ICA-D206-667). For D206-667-101/-103/-107/-201 and D407-667-105 crosstubes, the outward face of the support tabs should be 13.08" (332mm) from the crosstube center. For D206-667-203/-207 crosstubes, the outward face of the support tabs should be 10.03" (255mm) from the crosstube center. Ensure paint finish of crosstube is intact; touch up as required per Chapter 5 (5.3.9) of ICA-D206-667.
- 32.4.2 If present, remove any paint/primer on bottom of supports. Abrade mating surfaces of support and crosstube with 400-grit sandpaper. Saturate a clean cloth with MEK or 4105S Wash'n'Wipe Degreaser or equivalent and wipe until there is no residue.
- 32.4.3 Ensure a layer of 3M Scotch-Weld 2216 B/A Epoxy Adhesive is on the bottom of the support. If required, either apply or touch-up support to have a 0.03" to 0.05" thick layer of adhesive over the entire mating surface. Allow supports to cure for 24 hours.
- 32.4.4 Abrade mating surfaces of support (after cure) and crosstube with 180-grit sandpaper. Saturate a clean cloth with MEK or 4105S Wash'n'Wipe Degreaser or equivalent and wipe until there is no residue.
- 32.4.5 Apply a 0.04" to 0.07" thick layer of Proseal 890 Class B or AMS-S-8802 Class B sealant underneath applicable support and install support.
- 32.4.6 Install the clamps opposite to crosstube support as shown in Figures 32-4 to 32-8 of ICA-D206-667. Install rubber cushions underneath each clamp around the bottom circumference of the crosstube up to the crosstube centerline. Torque clamps 80-100 in-lb (9.0-11.3 Nm). It is acceptable to use smaller or larger sized MS21920-XX clamps than those listed in ICA-D206-667, ensure that after torquing the clamps per this instruction, the nuts are in safety but not bottomed out.
- 32.4.7 Prior to installing crosstube on aircraft, allow supports to cure for 72 hours and recheck torque on clamps.

CANADA
DEPARTMENT OF TRANSPORT
AIRCRAFT CERTIFICATION
BRANCH
DAO # 01-O-01

APPROVED

BY: 
D. SHEPHERD (DE # 02)

DATE: 11.07.20

CERT. NO.: SH01-5

ISSUE NO.: 3

A	NEW ISSUE	CP	11.07.15
REV.	DESCRIPTION	BY	DATE
DESIGN		DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN			
CHECKED	ASS	DRAWING NO.	REV. A
MFG. APPR.	N/A	DSI 9565	SHEET 1 OF 1
APPROVED		TITLE	SCALE
DE APPR.		SUPPORT INSTALLATION CHANGE	NTS
DATE	11.07.15	COPYRIGHT © 2011 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

DART SERVICE INSTRUCTION

TO AMEND INSTALLATION INSTRUCTIONS IIN-D206-667 REV. D AND EARLIER AND
INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA-D206-667 REV. 3 AND EARLIER

REF: CANADIAN STC: SH01-5
REF: FAA STC: SR01304NY
REF: EASA STC: EASA.IM.R.S.01179

PURPOSE:

The purpose of this service instruction is to permanently add the D206-667-017 Kit to the DXXX-667-101/-103/-105/-107 Crosstube kits.

INSTRUCTIONS:

DXXX-667-101/-103/-105/-107 Crosstubes at CHG 005/006/005/003 (respectively) and later are supplied with the D206-667-017 Grounding Strap Kit installed per section 3.2 of IIN-D206-667 Rev. D.

WEIGHT AND BALANCE

There is a negligible weight change associated with the installation of this kit.

CANADA
DEPARTMENT OF TRANSPORT
AIRCRAFT CERTIFICATION
BRANCH
DAO # 01-O-01

APPROVED

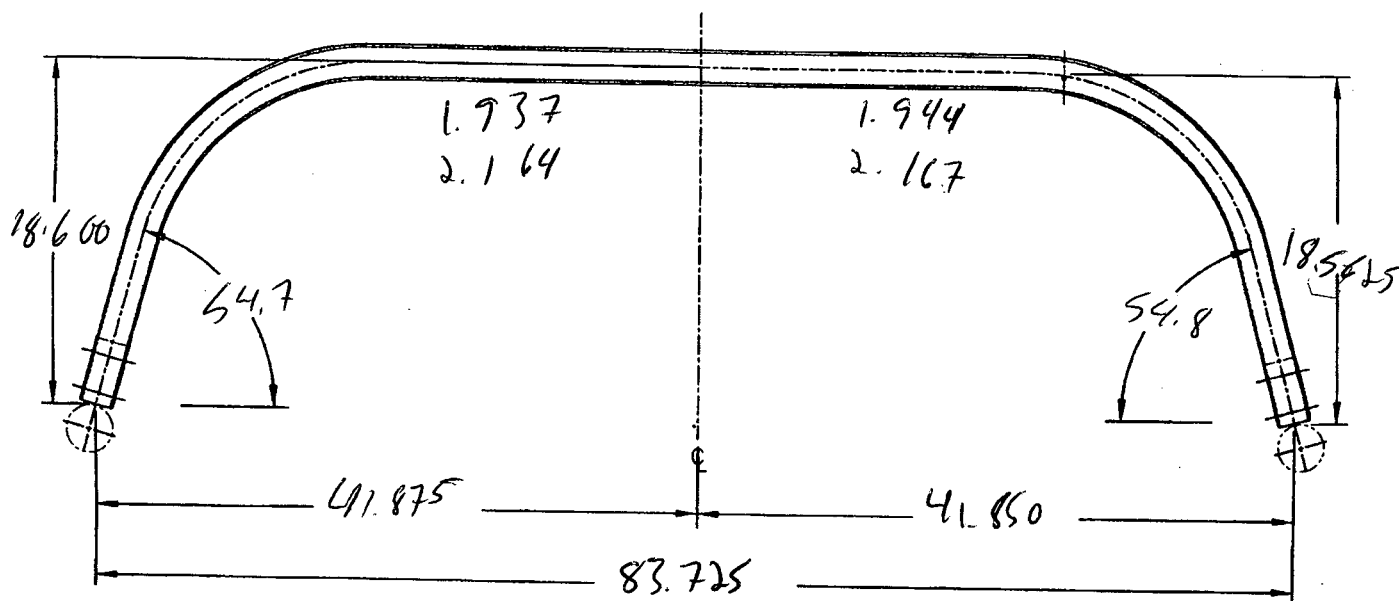
BY:

D. SHEPHERD (DE # 02)

DATE: 12.08.02
CERT. NO.: SH01-5
ISSUE NO.: 3

A	NEW ISSUE (REF CIR 12-3)	AJS	11.08.02
REV.	DESCRIPTION	BY	DATE
DESIGN	AJS	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	AJS		
CHECKED	<i>[Signature]</i>	DRAWING NO.	REV. A
MFG. APPR.	N/A	DSI 9628	SHEET 1 OF 1
APPROVED	<i>[Signature]</i>	TITLE	SCALE
DE APPR.	<i>[Signature]</i>	GROUNDING STRAP INSTALLATION	NTS
DATE	12.08.02	COPYRIGHT © 2012 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

Required Dimension	Min	Max
Height	18.34	18.60
1/2 Span	41.79	42.05
Angle	54°	56°
Total Span	83.59	84.09
Bending Passes	10	--
Crushing	--	6%



	Side A	Side B
Bending Passes	16	15
Crushing	< 5%	< 4%
	Comments	
	DAS	
	A7	

QC15 Inspection	9-89
Date	11-01-76

Rev	Date	Change	Revised by	Approved
A	12.02.15	New Issue	KJ	
B	12.04.16	Added bending, crushing dimensions	KJ	



skyservice Work Order Traveler

Sky Service F.B.O. Inc.

DOT APP 53-89 / EASA 145.7142 / BDA AMO 385

WO #: MWO27275	Customer: Dart Aerospace Ltd.	Dept: NDT YUL	Reference: 31296
Descr:	PN:	S/N:	Qty: 1
Make:	Model:	Reg:	A/C S/N:
TSN:	CSN:	TSO:	
Task: UNSCHEDULED			Sequence: 1

Work Required:

CARRY OUT NDT ON 7 CROSSTUBES AS PER PO31296

3 FWD CROSSTUBES, ITEM ID# D206-667-107BL, WORK ORDER ID# 138478, 138476, 138477

4 AFT CROSSTUBES, ITEM ID# D212-664-201, WORK ORDER ID# 140891, 140892, 130377, 130378

Action Taken:						Date:	Initial/Stamp:
LPI C/O IAW ASTM E-1417M-13						FEB 08 2016	
NO CRACK FOUND							
PEN. ZL-56, MPO13600, UV M-20141, CLEANER SKC-S MPO13923, DEV. MPO11715							
Description	Location	P/N	Qty	Batch	S/N Off	S/N On	
		DAS 38 9-09					
		FEB 09 2016					

I certified that the maintenance described above has been performed in accordance with the applicable standard of airworthiness.

Signature:	ACA/SCA Stamp 	Date: FEB 08 2016
Name: RAFIK MELIKIAN		



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO31296**

Purchase Order Date 2/8/2016

PO Print Date 2/8/2016

Page Number 2 of 4

Order From :
SKYSERVICE
6120 MIDFIELD ROAD
MISSISSAUGA, ONTARIO L5P 1B1
CANADA

VC-SKY001

Ship To : DART AEROSPACE LTD
1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

Contact Name
Vender Phone 905-678-5636

Ship To Contact
Ship To Phone

Ship Via: Delivered
Ship Acct:

Buyer Chantal Lavoie
Customer POID
Customer Tax # 10127-2607
Terms Net 30
Currency CAD
FOB FCA - (Free Carrier)

Line Total: \$137.15

3 138477

D206-667-107BL
CROSSTUBE

2/8/2016

1.00

\$137.15

\$137.15

Yes

2/8/2016

LIQUID PENETRANT INSPECTION AS PER QSI 038 OR
LPI AS PER ASTM 1417 LEVEL 2

Line Total: \$137.15

4 138478

D206-667-107BL
CROSSTUBE

2/8/2016

1.00

\$137.15

\$137.15

Yes

2/8/2016

LIQUID PENETRANT INSPECTION AS PER QSI 038 OR
LPI AS PER ASTM 1417 LEVEL 2

Line Total: \$137.15

5 130377

D212-664-201
CROSSTUBE

2/8/2016

1.00

\$137.15

\$137.15

Yes

2/8/2016

LIQUID PENETRANT INSPECTION AS PER QSI 038 OR
LPI AS PER ASTM 1417 LEVEL 2

Note:

2/8/2016

10/2/19
Sy